**Texas Commission on Environmental Quality**

**5 Chapter 115 – Control of Air Pollution from Volatile Organic Compounds**

**5E Subchapter E : Solvent-Using Processes**

**5E7 DIVISION 7 : MISCELLANEOUS INDUSTRIAL ADHESIVES**
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## SUBCHAPTER E: SOLVENT-USING PROCESSES
## DIVISION 7: MISCELLANEOUS INDUSTRIAL ADHESIVES
## §§115.470, 115.471, 115.473 - 115.475, 115.478, 115.479
## Effective June 25, 2015

### §115.470. Applicability and Definitions.

(a) Applicability. Except as specified in §115.471 of this title (relating to Exemptions), the requirements in this division apply to the owner or operator of a manufacturing operation using adhesives or adhesive primers for any of the application processes specified in §115.473(a) of this title (relating to Control Requirements) in the Dallas-Fort Worth and Houston-Galveston-Brazoria areas, as defined in §115.10 of this title (relating to Definitions). Adhesives or adhesive primers applied in the field (e.g., construction jobs in the field) are not subject to this division.

(b) Definitions. Unless specifically defined in the Texas Clean Air Act (Texas Health and Safety Code, Chapter 382) or in §§3.2, 101.1, or 115.10 of this title (relating to Definitions), the terms in this division have the meanings commonly used in the field of air pollution control. In addition, the following meanings apply in this division unless the context clearly indicates otherwise.

(1) **Acrylonitrile-butadiene-styrene or ABS welding**--Any process to weld acrylonitrile-butadiene-styrene pipe.

(2) **Adhesive**--Any chemical substance applied for the purpose of bonding two surfaces together other than by mechanical means.

(3) **Adhesive primer**--Any product intended by the manufacturer for application to a substrate, prior to the application of an adhesive, to provide a bonding surface.

(4) **Aerosol adhesive or adhesive primer**--An adhesive or adhesive primer packaged as an aerosol product in which the spray mechanism is permanently housed in a non-refillable can designed for handheld application without the need for ancillary hoses or spray equipment.

(5) **Aerospace component**--Any fabricated part, processed part, assembly of parts, or completed unit of any aircraft including but not limited to airplanes, helicopters, missiles, rockets, and space vehicles. This definition includes electronic components.

(6) **Application process**--A series of one or more application systems and any associated drying area or oven where an adhesive or adhesive primer is applied, dried, or cured. An application process ends at the point where the adhesive is dried or cured, or prior to any subsequent application of a different adhesive. It is not necessary for an application process to have an oven or flash-off area.

(7) **Application system**--Devices or equipment designed for the purpose of applying an adhesive or adhesive primer to a surface. The devices may include, but are not be limited to, brushes, sprayers, flow coaters, dip tanks, rollers, and extrusion coaters.

(8) **Ceramic tile installation adhesive**--Any adhesive intended by the manufacturer for use in the installation of ceramic tiles.

(9) **Chlorinated polyvinyl chloride plastic or CPVC plastic welding**--A polymer of the vinyl chloride monomer that contains 67% chlorine and is normally identified with a chlorinated polyvinyl chloride marking.

(10) **Chlorinated polyvinyl chloride welding or CPVC welding**--An adhesive labeled for welding of chlorinated polyvinyl chloride.

(11) **Contact adhesive**--An adhesive:

(A) designed for application to both surfaces to be bonded together;

(B) allowed to dry before the two surfaces are placed in contact with each other;

(C) forms an immediate bond that is impossible, or difficult, to reposition after both adhesive-coated surfaces are placed in contact with each other;

(D) does not need sustained pressure or clamping of surfaces after the adhesive-coated surfaces have been brought together using sufficient momentary pressure to establish full contact between both surfaces; and

(E) does not include rubber cements that are primarily intended for use on paper substrates or vulcanizing fluids that are designed and labeled for tire repair only.

(12) **Cove base**--A flooring trim unit, generally made of vinyl or rubber, having a concave radius on one edge and a convex radius on the opposite edge that is used in forming a junction between the bottom wall course and the floor or to form an inside corner.

(13) **Cove base installation adhesive**--Any adhesive intended by the manufacturer to be used for the installation of cove base or wall base on a wall or vertical surface at floor level.

(14) **Cyanoacrylate adhesive**--Any adhesive with a cyanoacrylate content of at least 95% by weight.

(15) **Daily weighted average**--The total weight of volatile organic compounds (VOC) emissions from all adhesives or adhesive primers subject to the same VOC content limit in §115.473(a) of this title (relating to Control Requirements), divided by the total volume of those adhesives or adhesive primers (minus water and exempt solvent) delivered to the application system each day. Adhesives or adhesive primers subject to different emission standards in §115.473(a) of this title must not be combined for purposes of calculating the daily weighted average. In addition, determination of compliance is based on each adhesive or adhesive primer application process.

(16) **Ethylene propylenediene monomer (EPDM) roof membrane**--A prefabricated single sheet of elastomeric material composed of ethylene propylenediene monomer and that is field-applied to a building roof using one layer or membrane material.

(17) **Flexible vinyl**--Non-rigid polyvinyl chloride plastic with a 5.0% by weight plasticizer content.

(18) **Indoor floor covering installation adhesive**--Any adhesive intended by the manufacturer for use in the installation of wood flooring, carpet, resilient tile, vinyl tile, vinyl-backed carpet, resilient sheet and roll, or artificial grass. Adhesives used to install ceramic tile and perimeter-bonded sheet flooring with vinyl backing onto a non-porous substrate, such as flexible vinyl, are excluded from this definition.

(19) **Laminate**--A product made by bonding together two or more layers of material.

(20) **Metal to urethane/rubber molding or casting adhesive**--Any adhesive intended by the manufacturer to bond metal to high density or elastomeric urethane or molded rubber materials, in heater molding or casting processes, to fabricate products such as rollers for computer printers or other paper handling equipment.

(21) **Motor vehicle adhesive**--An adhesive, including glass-bonding adhesive, used in a process that is not an automobile or light-duty truck assembly

coating process, applied for the purpose of bonding two vehicle surfaces together without regard to the substrates involved.

(22) **Motor vehicle glass-bonding primer**--A primer, used in a process that is not an automobile or light-duty truck assembly coating process, applied to windshield or other glass, or to body openings, to prepare the glass or body opening for the application of glass-bonding adhesives or the installation of adhesive-bonded glass. Motor vehicle glass-bonding primer includes glass-bonding/cleaning primers that perform both functions (cleaning and priming of the windshield or other glass, or body openings) prior to the application of adhesive or the installation of adhesive-bonded glass.

(23) **Motor vehicle weatherstrip adhesive**--An adhesive, used in a process that is not an automobile or light-duty truck assembly coating process, applied to weatherstripping materials for the purpose of bonding the weatherstrip material to the surface of the vehicle.

(24) **Multipurpose construction adhesive**--Any adhesive intended by the manufacturer for use in the installation or repair of various construction materials, including but not limited to drywall, subfloor, panel, fiberglass reinforced plastic (FRP), ceiling tile, and acoustical tile.

(25) **Outdoor floor covering installation adhesive**--Any adhesive intended by the manufacturer for use in the installation of floor covering that is not in an enclosure and that is exposed to ambient weather conditions during normal use.

(26) **Panel installation**--The installation of plywood, pre-decorated hardboard or tileboard, fiberglass reinforced plastic, and similar pre-decorated or non-decorated panels to studs or solid surfaces using an adhesive formulated for that purpose.

(27) **Perimeter bonded sheet flooring installation**--The installation of sheet flooring with vinyl backing onto a nonporous substrate using an adhesive designed to be applied only to a strip of up to four inches wide around the perimeter of the sheet flooring.

(28) **Plastic solvent welding adhesive**--Any adhesive intended by the manufacturer for use to dissolve the surface of plastic to form a bond between mating surfaces.

(29) **Plastic solvent welding adhesive primer**--Any primer intended by the manufacturer for use to prepare plastic substrates prior to bonding or welding.

(30) **Plastic foam**--Foam constructed of plastics.

(31) **Plastics**--Synthetic materials chemically formed by the polymerization of organic (carbon-based) substances. Plastics are usually compounded with modifiers, extenders, or reinforcers and are capable of being molded, extruded, cast into various shapes and films, or drawn into filaments.

(32) **Polyvinyl chloride plastic or PVC plastic**--A polymer of the chlorinated vinyl monomer that contains 57% chlorine.

(33) **Polyvinyl chloride welding adhesive or PVC welding adhesive**--Any adhesive intended by the manufacturer for use in the welding of polyvinyl chloride plastic pipe.

(34) **Porous material**--A substance that has tiny openings, often microscopic, in which fluids may be absorbed or discharged, including, but not limited to, paper and corrugated paperboard. For the purposes of this definition, porous material does not include wood.

(35) **Pounds of volatile organic compounds (VOC) per gallon of adhesive (minus water and exempt solvent)**--The basis for content limits for application processes that can be calculated by the following equation:

Figure: 30 TAC §115.470(b)(35)

$$\text{Pounds of volatile organic compounds (VOC) per gallon of adhesive (minus water and exempt solvent)} = \frac{W_V}{(V_M - V_W - V_{ES})}$$

Where:

$W_V$ = The weight of VOC contained in $V_M$ gallons of adhesive or adhesive primer measured in pounds.
$V_M$ = The volume of adhesive or adhesive primer, generally assumed to be one gallon.
$V_W$ = The volume of water contained in $V_M$ gallons of adhesive or adhesive primer measured in gallons.
$V_{ES}$ = The volume of exempt solvent contained in $V_M$ gallons of adhesive or adhesive primer measured in gallons.

(36) **Pounds of volatile organic compounds (VOC) per gallon of solids**--The basis for content limits for application processes that can be calculated by the following equation:

Figure: 30 TAC §115.470(b)(36)

$$\text{Pounds of volatile organic compounds (VOC) per gallon of solids} = \frac{W_V}{V_M - V_V - V_W - V_{ES}}$$

Where:
$W_V$ = The weight of VOC contained in $V_M$ gallons of adhesive or adhesive primer measured in pounds.
$V_M$ = The volume of adhesive or adhesive primer, generally assumed to be one gallon.
$V_V$ = The volume of VOC contained in $V_M$ gallons of adhesive or adhesive primer measured in gallons.
$V_W$ = The volume of water contained in $V_M$ gallons of adhesive or adhesive primer measured in gallons.
$V_{ES}$ = The volume of exempt solvent contained in $V_M$ gallons of adhesive or adhesive primer measured in gallons.

(37) **Reinforced plastic composite**--A composite material consisting of plastic reinforced with fibers.

(38) **Rubber**--Any natural or manmade rubber substrate, including, but not limited to, styrene-butadiene rubber, polychloroprene (neoprene), butyl rubber, nitrile rubber, chlorosulfonated polyethylene, and ethylene propylene diene terpolymer.

(39) **Sheet rubber lining installation**--The process of applying sheet rubber liners by hand to metal or plastic substrates to protect the underlying substrate from corrosion or abrasion. These processes also include laminating sheet rubber to fabric by hand.

(40) **Single-ply roof membrane**--A prefabricated single sheet of rubber, normally ethylene propylenediene terpolymer, that is field-applied to a building roof using one layer of membrane material. For the purposes of this definition, single-ply roof membrane does not include membranes prefabricated from ethylene propylenediene monomer.

(41) **Single-ply roof membrane installation and repair adhesive**--Any adhesive labeled for use in the installation or repair of single-ply roof membrane. Installation includes, as a minimum, attaching the edge of the membrane to the edge of the roof and applying flashings to vents, pipes, and ducts that protrude through the membrane. Repair includes gluing the edges of torn membrane together, attaching a patch over a hole, and reapplying flashings to vents, pipes, or ducts installed through the membrane.

(42) **Single-ply roof membrane adhesive primer**--Any primer labeled for use to clean and promote adhesion of the single-ply roof membrane seams or splices prior to bonding.

(43) **Structural glazing**--A process that includes the application of adhesive to bond glass, ceramic, metal, stone, or composite panels to exterior building frames.

(44) **Subfloor installation**--The installation of subflooring material over floor joists, including the construction of any load-bearing joists. Subflooring is covered by a finish surface material.

(45) **Thin metal laminating adhesive**--Any adhesive intended by the manufacturer for use in bonding multiple layers of metal to metal or metal to plastic in the production of electronic or magnetic components in which the thickness of the bond line(s) is less than 0.25 mil.

(46) **Tire repair**--A process that includes expanding a hole, tear, fissure, or blemish in a tire casing by grinding or gouging, applying adhesive, and filling the hole or crevice with rubber.

(47) **Undersea-based weapon system components**--The fabrication of parts, assembly of parts or completed units of any portion of a missile launching system used on undersea ships.

(48) **Waterproof resorcinol glue**--A two-part resorcinol-resin-based adhesive designed for applications where the bond line must be resistant to conditions of continuous immersion in fresh or salt water.

Adopted December 7, 2011 Effective December 29, 2011

**§115.471. Exemptions.**

(a) The owner or operator of application processes located on a property with actual combined emissions of volatile organic compounds (VOC) less than 3.0 tons per calendar year, when uncontrolled, from all adhesives, adhesive primers, and solvents used during related cleaning operations, is exempt from the requirements of this division, except as specified in §115.478(b)(2) of this title (relating to Monitoring and Recordkeeping Requirements). When calculating the VOC emissions, adhesives and adhesive primers that are exempt under subsections (b) and (c) of this section are excluded.

(b) The following application processes are exempt from the VOC limits in §115.473(a) of this title (relating to Control Requirements) and the application system requirements in §115.473(b) of this title:

(1) adhesives or adhesive primers being tested or evaluated in any research and development, quality assurance, or analytical laboratory;

(2) adhesives or adhesive primers used in the assembly, repair, or manufacture of aerospace components or undersea-based weapon system components;

(3) adhesives or adhesive primers used in medical equipment manufacturing operations;

(4) cyanoacrylate adhesive application processes;

(5) aerosol adhesive and aerosol adhesive primer application processes;

(6) polyester-bonding putties used to assemble fiberglass parts at fiberglass boat manufacturing properties and at other reinforced plastic composite manufacturing properties; and

(7) processes using adhesives and adhesive primers that are supplied to the manufacturer in containers with a net volume of 16 ounces or less or a net weight of 1.0 pound or less.

(c) The owner or operator of any process or operation subject to another division of this chapter that specifies VOC content limits for adhesives or adhesive primers used during any of the application processes listed in §115.473(a) of this title, is exempt from the requirements in this division. Adhesives and adhesive primers used for miscellaneous metal and plastic parts surface coating processes in §115.453(a)(1)(C) - (F) and (2) of this title (related to Control Requirements) meeting a specialty application process definition in §115.470 of this title (relating to Applicability and Definitions) are not included in this exemption. Contact adhesives are not included in this exemption. When an adhesive or adhesive primer meets more than one adhesive application process definition in §115.470 of this title, the least stringent VOC content limit applies.

Adopted June 3, 2015 Effective June 25, 2015

**§115.473. Control Requirements.**

(a) The owner or operator shall limit volatile organic compounds (VOC) emissions from all adhesives and adhesive primers used during the specified application processes to the following VOC content limits in pounds of VOC per gallon of adhesive

(lb VOC/gal adhesive) (minus water and exempt solvent compounds), as delivered to the application system. These limits are based on the daily weighted average of all adhesives or adhesive primers delivered to the application system each day. If an adhesive or adhesive primer is used to bond dissimilar substrates together, then the applicable substrate category with the least stringent VOC content limit applies.

Figure: 30 TAC §115.473(a)

**Table 1.**

| General Adhesive Application Processes | Pounds of volatile organic compounds (VOC) per gallon adhesive |
|---|---|
| Reinforced Plastic Composite | 1.7 |
| Flexible Vinyl | 2.1 |
| Metal | 0.3 |
| Porous Material (Except Wood) | 1.0 |
| Rubber | 2.1 |
| Wood | 0.3 |
| Other Substrates | 2.1 |

**Table 2.**

| Specialty Adhesive Application Processes | Pounds of VOC per gallon adhesive |
|---|---|
| Ceramic Tile Installation | 1.1 |
| Contact Adhesive | 2.1 |
| Cove Base Installation | 1.3 |
| Floor Covering Installation (Indoor) | 1.3 |
| Floor Covering Installation (Outdoor) | 2.1 |
| Floor Covering Installation (Perimeter Bonded Sheet Vinyl) | 5.5 |
| Metal to Urethane/Rubber Molding or Casting | 7.1 |
| Motor Vehicle Adhesive | 2.1 |
| Motor Vehicle Weatherstrip Adhesive | 6.3 |

| | |
|---|---|
| Multipurpose Construction | 1.7 |
| Plastic Solvent Welding Acrylonitrile Butadiene Styrene (ABS) | 3.3 |
| Plastic Solvent Welding (Except ABS) | 4.2 |
| Sheet Rubber Lining Installation | 7.1 |
| Single-Ply Roof Membrane Installation/Repair (Except Ethylene Propylene Diene Monomer) | 2.1 |
| Structural Glazing | 0.8 |
| Thin Metal Laminating | 6.5 |
| Tire Repair | 0.8 |
| Waterproof Resorcinol Glue | 1.4 |

**Table 3.**

| **Adhesive Primer Application Processes** | **Pounds of VOC per gallon adhesive** |
|---|---|
| Motor Vehicle Glass-Bonding Primer | 7.5 |
| Plastic Solvent Welding Adhesive Primer | 5.4 |
| Single-Ply Roof Membrane Adhesive Primer | 2.1 |
| Other Adhesive Primer | 2.1 |

(1) The owner or operator shall meet the VOC content limits in this subsection by using one of the following options.

(A) The owner or operator shall apply low-VOC adhesives or adhesive primers.

(B) The owner or operator shall apply adhesives or adhesive primers in combination with the operation of a vapor control system.

(2) As an alternative to paragraph (1) of this subsection, the owner or operator may operate a vapor control system capable of achieving an overall control efficiency of 85% of the VOC emissions from adhesives and adhesive primers. Control device and capture efficiency testing must be performed in accordance with the testing requirements in §115.475(3) and (4) of this title (relating to Approved Test Methods and

Testing Requirements). If the owner or operator complies with the overall control efficiency option under this paragraph, then the owner or operator is exempt from the application system requirements of subsection (b) of this section.

(3) An owner or operator applying adhesives or adhesive primers in combination with a vapor control system to meet the VOC content limits in paragraph (1) of this subsection, shall use the following equation to determine the minimum overall control efficiency necessary to demonstrate equivalency. Control device and capture efficiency testing must be performed in accordance with the testing requirements in §115.475(3) and (4) of this title.

Figure: 30 TAC §115.473(a)(3)

Equation 1.

$$S = \frac{C}{\left(1 - \left(\frac{C}{D}\right)\right)}$$

Where:

S = The applicable volatile organic compounds (VOC) emission limit expressed on a pounds of VOC per gallon of solids basis.

C = The applicable VOC content limit from Tables 1 - 3 in subsection (a) of this section expressed on a pounds of VOC per gallon of adhesive basis.

D = An assumed density of 7.36 pounds of VOC per gallon of VOC.

Equation 2.

$$E = \frac{(VOC - S)}{VOC}$$

Where:

E = The required overall control efficiency, decimal fraction.

VOC = The volatile organic compounds (VOC) content of the adhesives or adhesive primers used for each application process expressed on a solids basis in pounds of VOC per gallon of solids. The owner or operator may choose to use either a daily weighted average or the maximum VOC content.

S = The applicable VOC emission limit expressed on a pounds of VOC per gallon of solids basis calculated using Equation 1.

(b) The owner or operator of any application process subject to this division shall not apply adhesives or adhesive primers unless one of the following application systems is used:

(1) electrostatic spray;

(2) high-volume, low-pressure spray (HVLP);

(3) flow coat;

(4) roll coat or hand application, including non-spray application methods similar to hand or mechanically powered caulking gun, brush, or direct hand application;

(5) dip coat;

(6) airless spray;

(7) air-assisted airless spray; or

(8) other application system capable of achieving a transfer efficiency equivalent to or better than that achieved by HVLP spray. For the purpose of this requirement, the transfer efficiency of HVLP spray is assumed to be 65%. The owner or operator shall demonstrate that either the application system being used is equivalent to the transfer efficiency of an HVLP spray or that the application system being used has a transfer efficiency of at least 65%.

(c) The following work practices apply to the owner or operator of each application process subject to this division.

(1) For the storage, mixing, and handling of all adhesives, adhesive primers, thinners, and adhesive-related waste materials, the owner or operator shall:

(A) store all VOC-containing adhesives, adhesive primers, and process-related waste materials in closed containers;

(B) ensure that mixing and storage containers used for VOC-containing adhesives, adhesive primers, and process-related waste materials are kept closed at all times;

(C) minimize spills of VOC-containing adhesives, adhesive primers, and process-related waste materials; and

(D) convey VOC-containing adhesives, adhesive primers, and process-related waste materials from one location to another in closed containers or pipes.

(2) For the storage, mixing, and handling of all surface preparation materials and cleaning materials, the owner or operator shall:

(A) store all VOC-containing cleaning materials and used shop towels in closed containers;

(B) ensure that storage containers used for VOC-containing cleaning materials are kept closed at all times except when depositing or removing these materials;

(C) minimize spills of VOC-containing cleaning materials;

(D) convey VOC-containing cleaning materials from one location to another in closed containers or pipes; and

(E) minimize VOC emissions from the cleaning of application, storage, mixing, and conveying equipment by ensuring that equipment cleaning is performed without atomizing the cleaning solvent and all spent solvent is captured in closed containers.

(d) An application process that becomes subject to subsection (a) of this section by exceeding the exemption limits in §115.471(a) of this title (relating to Exemptions) is subject to the provisions in subsection (a) of this section even if throughput or emissions later fall below exemption limits unless emissions are maintained at or below the controlled emissions level achieved while complying with subsection (a) of this section and one of the following conditions is met.

(1) The project that caused a throughput or emission rate to fall below the exemption limits in §115.471(a) of this title must be authorized by a permit, permit amendment, standard permit, or permit by rule required by Chapters 106 or 116 of this title (relating to Permits by Rule; and Control of Air Pollution by Permits for New Construction or Modification, respectively). If a permit by rule is available for the project, the owner or operator shall continue to comply with subsection (a) of this section for 30 days after the filing of documentation of compliance with that permit by rule.

(2) If authorization by permit, permit amendment, standard permit, or permit by rule is not required for the project, the owner or operator shall provide the executive director 30 days notice of the project in writing.

Adopted June 3, 2015 Effective June 25, 2015

**§115.474. Alternate Control Requirements.**

For the owner or operator of an application process subject to this division, alternate methods of demonstrating and documenting continuous compliance with the applicable control requirements or exemption criteria in this division may be approved by the executive director in accordance with §115.910 of this title (relating to Availability of Alternate Means of Control) if emission reductions are demonstrated to be substantially equivalent.

Adopted December 7, 2011 Effective December 29, 2011

**§115.475. Approved Test Methods and Testing Requirements.**

The owner or operator shall demonstrate compliance with the volatile organic compounds (VOC) content limits in §115.473(a) of this title (relating to Control Requirements) by applying the following test methods, as appropriate. Where a test method also inadvertently measures compounds that are exempt solvent, an owner or operator may exclude the exempt solvent when determining compliance with a VOC content limit. As an alternative to the test methods in this section, the VOC content of an adhesive or adhesive primer may be determined by using analytical data from the material safety data sheet.

(1) Except for reactive adhesives, compliance with the VOC content limits in §115.473(a) of this title must be determined using Method 24 (40 Code of Federal Regulations (CFR) Part 60, Appendix A).

(2) Compliance with the VOC content limits for reactive adhesives in §115.473(a) of this title must be determined using 40 CFR Part 63, Subpart PPPP, Appendix A, (as amended through April 24, 2007 (72 FR 20237)).

(3) The owner or operator of an application process subject to §115.473 of this title shall measure the capture efficiency using the applicable procedures outlined in 40 CFR §52.741, Subpart O, Appendix B (as amended through October 21, 1996 (61 FR 54559)). These procedures are: Procedure T-Criteria for and Verification of a Permanent or Temporary Total Enclosure; Procedure L - VOC Input; Procedure G.2 - Captured VOC Emissions (Dilution Technique); Procedure F.1 - Fugitive VOC Emissions from Temporary Enclosures; and Procedure F.2 - Fugitive VOC Emissions from Building Enclosures.

(A) The following exemptions apply to capture efficiency testing requirements.

(i) If a source installs a permanent total enclosure that meets the specifications of Procedure T and that directs all VOC to a control device, then the capture efficiency is assumed to be 100%, and the source is exempted from capture efficiency testing requirements. This does not exempt the source from performance of any control device efficiency testing that may be required. In addition, a source must demonstrate all criteria for a permanent total enclosure are met during testing for control efficiency.

(ii) If a source uses a vapor control system designed to collect and recover VOC (e.g., carbon adsorption system), an explicit measurement of capture efficiency is not necessary if the following conditions are met. The overall control efficiency of the system can be determined by directly comparing the input liquid VOC to the recovered liquid VOC. The general procedure for use in this situation is given in 40 CFR §60.433 (as amended through October 17, 2000 (65 FR 61761)), with the following additional restrictions.

(I) The source must be able to equate solvent usage with solvent recovery on a 24-hour (daily) basis, rather than a 30-day weighted average. This verification must be done within 72 hours following each 24-hour period of the 30-day period.

(II) The solvent recovery system (i.e., capture and control system) must be dedicated to a single process line (e.g., one process line venting to a carbon adsorber system) or if the solvent recovery system controls multiple process lines, the source must be able to demonstrate that the overall control efficiency (i.e., the total recovered solvent VOC divided by the sum of liquid VOC input to all process lines venting to the control system) meets or exceeds the most stringent standard applicable for any process line venting to the control system.

(B) The capture efficiency must be calculated using one of the following protocols referenced unless a suitable alternative protocol is approved by the executive director and the United States Environmental Protection Agency (EPA).

(i) Gas/gas method using temporary total enclosure (TTE). The EPA specifications to determine whether a temporary enclosure is considered a TTE are given in Procedure T. The capture efficiency equation to be used for this protocol is:

Figure: 30 TAC §115.475(3)(B)(i)

$$CE = \frac{G_W}{(G_W + F_W)}$$

Where:
CE = The capture efficiency, decimal fraction.
$G_W$ = The mass of volatile organic compounds (VOC) captured and delivered to control device using a temporary total enclosure (TTE) (use Procedure G.2).
$F_W$ = The mass of fugitive VOC that escapes from a TTE (use Procedure F.1).

(ii) Liquid/gas method using TTE. The EPA specifications to determine whether a temporary enclosure is considered a TTE are given in Procedure T. The capture efficiency equation to be used for this protocol is:

Figure: 30 TAC §115.475(3)(B)(ii)

$$CE = \frac{(L - F)}{L}$$

Where:
CE = Capture efficiency, decimal fraction.
L = The mass of liquid volatile organic compounds (VOC) input to process (use Procedure L).
F = The mass of fugitive VOC that escapes from a temporary total enclosure (use Procedure F.1).

(iii) Gas/gas method using the building or room enclosure (BE) in which the affected source is located and in which the mass of VOC captured and delivered to a control device and the mass of fugitive VOC that escapes from BE are measured while operating only the affected facility. All fans and blowers in the BE must be operating as they would under normal production. The capture efficiency equation to be used for this protocol is:

Figure: 30 TAC §115.475(3)(B)(iii)

$$CE = \frac{G}{(G + F_B)}$$

Where:
CE = Capture efficiency, decimal fraction.
G = The mass of volatile organic compounds (VOC) captured and delivered to a control device (use Procedure G.2).
$F_B$ = The mass of fugitive VOC that escapes from the building or room enclosure (use Procedure F.2).

(iv) Liquid/gas method using a BE in which the mass of liquid VOC input to process and the mass of fugitive VOC that escapes from BE are measured while operating only the affected facility. All fans and blowers in the BE must be operated as they would under normal production. The capture efficiency equation to be used for this protocol is:

Figure: 30 TAC §115.475(3)(B)(iv)

$$CE = \frac{L}{F_B - L}$$

Where:
CE = The capture efficiency, decimal fraction.
L = The mass of liquid volatile organic compounds (VOC) input to process (use Procedure L).
$F_B$ = The mass of fugitive VOC that escapes from building or room enclosure (use Procedure F.2).

(C) The operating parameters selected for monitoring the capture system for compliance with the requirements in §115.478(a) of this title (relating to Monitoring and Recordkeeping requirements) must be monitored and recorded during the initial capture efficiency testing and thereafter during facility operation. The executive director may require a new capture efficiency test if the operating parameter values change significantly from those recorded during the initial capture efficiency test.

(4) In addition to the requirements of paragraph (3) of this section, the owner or operator shall determine compliance with §115.473(a)(2) of this title by applying the following test methods, as appropriate:

(A) Methods 1 - 4 (40 CFR Part 60, Appendix A) for determining flow rates, as necessary;

(B) Method 25 (40 CFR Part 60, Appendix A) for determining total gaseous nonmethane organic emissions as carbon;

(C) Method 25A or 25B (40 CFR Part 60, Appendix A) for determining total gaseous organic concentrations using flame ionization or nondispersive infrared analysis; and

(D) additional performance test procedures described in 40 CFR §60.444 (as amended through October 18, 1983 (48 FR 48375)).

(5) Minor modifications to the methods in paragraphs (1) - (4) of this section may be approved by the executive director. Methods other than those specified in paragraphs (1) - (4) of this section may be used if approved by the executive director and validated using Method 301 (40 CFR Part 63, Appendix A). For the purposes of this paragraph, substitute "executive director" each place that Method 301 references "administrator."

Adopted December 7, 2011 Effective December 29, 2011

**§115.478. Monitoring and Recordkeeping Requirements.**

(a) Monitoring requirements. The following monitoring requirements apply to the owner or operator of an application process subject to this division that uses a vapor control system in accordance with §115.473(a)(2) of this title (relating to Control Requirements). The owner or operator shall install and maintain monitors to accurately measure and record operational parameters of all required control devices, as necessary, to ensure the proper functioning of those devices in accordance with design specifications, including:

(1) continuous monitoring of the exhaust gas temperature immediately downstream of direct-flame incinerators or the gas temperature immediately upstream and downstream of any catalyst bed;

(2) the total amount of volatile organic compounds (VOC) recovered by carbon adsorption or other solvent recovery systems during a calendar month;

(3) continuous monitoring of carbon adsorption bed exhaust; and

(4) appropriate operating parameters for vapor control systems other than those specified in paragraphs (1) - (3) of this subsection.

(b) Recordkeeping requirements. The following recordkeeping requirements apply to the owner or operator of an application process subject to this division.

(1) The owner or operator shall maintain records of the testing data or the material safety data sheet in accordance with the requirements in §115.475(1) of this title (relating to Approved Test Methods and Testing Requirements). Records must be sufficient to demonstrate continuous compliance with the VOC limits in §115.473(a) of this title.

(2) The owner or operator of an application process claiming an exemption in §115.471 of this title (relating to Exemptions) shall maintain records sufficient to demonstrate continuous compliance with the applicable exemption criteria.

(3) The owner or operator shall maintain records of any testing conducted at an affected facility in accordance with the provisions specified in §115.475(3) and (4) of this title.

(4) Records must be maintained a minimum of two years and made available upon request to authorized representatives of the executive director, the United States Environmental Protection Agency, or any local air pollution agency with jurisdiction.

Adopted December 7, 2011 Effective December 29, 2011

**§115.479. Compliance Schedules.**

(a) The owner or operator of an application process in Brazoria, Chambers, Collin, Dallas, Denton, Ellis, Fort Bend, Galveston, Harris, Johnson, Kaufman, Liberty, Montgomery, Parker, Rockwall, Tarrant, and Waller, Counties shall comply with this division no later than March 1, 2013.

(b) The owner or operator of an application process in Wise County shall comply with this division as soon as practicable, but no later than January 1, 2017.

(c) The owner or operator of an application process that becomes subject to this division on or after the applicable compliance date in this section shall comply with the requirements in this division no later than 60 days after becoming subject.

(d) Upon the date the commission publishes notice in the *Texas Register* that the Wise County nonattainment designation for the 2008 Eight-Hour Ozone National Ambient Air Quality Standard is no longer legally effective, the owner or operator of each application process in Wise County is not required to comply with any of the requirements in this division.

Adopted June 3, 2015 Effective June 25, 2015